line 6, after "out" insert --by--.

Claim 12, line 2, delete "9 or 10,".

Claim 13, line 2, delete "9 or 10,".

Claim 14, line 2, delete "9 or 10,".

line 4, delete ")".

Claim 15, line 2, delete "9 or 10,".

Please add the following new claims:

-- 17. A diffractive optical element according to claim 9, wherein a ratio of the depth of the second relief pattern to the depth of the first relief pattern $\alpha(=d_2/d_1)$ is set such that a phase shift function of the first relief pattern and a phase shift function of the second relief pattern are canceled out by each other.

18. A diffractive optical element according to claim 10, wherein a ratio of the depth of the second relief pattern to the depth of the first relief pattern $\alpha(=d_2/d_1)$ is set such that a phase shift function of the first relief pattern and a phase shift function of the second relief pattern are canceled out by each other.

19. A diffractive optical element according to claim 9, wherein said second and third optical regions are made of a same optical material.

20. A diffractive optical element according to claim 10, wherein said second and third optical regions are made of a same optical material.

21. A diffractive optical element according to claim 9, wherein said fourth optical region is constituted by an atmosphere surrounding the diffractive optical element.

22. A diffractive optical element according to claim 10, wherein said fourth optical region is constituted by an atmosphere surrounding the diffractive optical element.

23. A diffractive optical element according to claim 9, wherein when an average refractive index of a composite relief structure constituted by the first and second relief patterns is n_0, a thickness of the diffractive optical element is D, and a smallest pitch of the relief patterns is T, the following condition is satisfied:

$$\frac{2\pi\lambda D}{n_0 T^2} < 1$$

24. A diffractive optical element according to claim 10, wherein when an average refractive index of a composite relief structure constituted by the first and second relief patterns is n_0, a thickness of the diffractive optical element is D, and a smallest pitch of the relief patterns is T, the following condition is satisfied:

$$\frac{2\pi\lambda D}{n_0 T^2} < 1$$

25. A diffractive optical element according to claim 9, wherein when a shortest wavelength of the wavelength range to be used is λ_1, a longest wavelength of the wavelength range to be used is λ_2, and a middle wavelength between λ_1 and λ_2 is λ_0 $(=(\lambda_1 + \lambda_2)/2)$, the following condition is satisfied:

$$\lambda_2 - \lambda_1 > 0.05\lambda_0$$

26. A diffractive optical element according to claim 9, wherein when a shortest wavelength of the wavelength range to be used is λ_1, a longest wavelength of the wavelength range to be used is λ_2, and a middle wavelength between λ_1 and λ_2 is λ_0 $(=(\lambda_1 + \lambda_2)/2)$, the following condition is satisfied:

$$\lambda_2 - \lambda_1 > 0.05\lambda_0$$

27. An optical device comprising a diffractive optical element according to any one of claim 8.

28. An optical device comprising a diffractive optical element according to any one of claim 9.

29. An optical device comprising a diffractive optical element according to any one of claim 10.

30. An optical device comprising a diffractive optical element according to any one of claim 11.

31. An optical device comprising a diffractive optical element according to any one of claim 12.

32. An optical device comprising a diffractive optical element according to any one of claim 13.

33. An optical device comprising a diffractive optical element according to any one of claim 14.

34. An optical device comprising a diffractive optical element according to any one of claim 15.

35. A diffractive optical element comprising:

a first optical region made of a first optical material which reflects light within a wavelength range to be used;

a second optical region made of a second optical material which is substantially transparent to said light;

a third optical region made of a third optical material which is substantially transparent to said light but is different from said second optical material, said first, second and third optical regions being arranged to be brought into contact with each other or being arranged close to each other;

a first relief pattern formed in a boundary surface between said first and second optical regions and having a first pitch distribution and a first depth; and

a second relief pattern formed in a boundary surface between said second and third optical regions and having a second pitch distribution which is substantially identical with said first pitch distribution of the first relief pattern and a second depth which is different from said first depth of the first relief pattern, said first and second relief patterns being substantially aligned in a direction of an optical axis of the diffractive optical element;

wherein a ratio of the depth of the second relief pattern to the depth of the first relief pattern $\alpha(=d_2/d_1)$ is set such that a phase shift function of the first relief pattern and a phase shift function of the second relief pattern are canceled out by each other.

36. A diffractive optical element comprising:

a first optical region made of a first optical material which is substantially transparent to light within a wavelength range to be used and has a refractive index n_1;

a second optical region made of a second optical material which is substantially transparent to said light but is different from said first optical material and has a refractive index n_2;

a third optical region made of a third optical material which is transparent to said light but is different from said second optical material and has a refractive index n_3, said first, second and third optical regions being arranged to be brought into contact with each other or being arranged close to each other;

a first relief pattern formed in a boundary surface between said first and second optical regions and having a first pitch distribution and a depth d_1; and

a second relief pattern formed in a boundary surface between said second and third optical regions and having a second pitch distribution which is substantially identical with said first pitch distribution of the first relief pattern and a second depth d_2, said first and second relief patterns being substantially aligned in a direction of an optical axis of the diffractive optical element, wherein when a ratio of the depth of the second relief

pattern to the depth of the second relief pattern is $\alpha(=d_2/d_1)$, a wavelength of the light within the wavelength range to be used is λ, a shortest wavelength of the wavelength region to be used is λ_1, and a longest wavelength of the wavelength range to be used is λ_2, the following condition is satisfied:

$$|\Delta N(\lambda_2)| > |\Delta N(\lambda_1)| > 0;\ \lambda_2 > \lambda_1$$

wherein

$$\Delta N(\lambda) = \{n_1(\lambda)-n_2(\lambda)\} + \alpha\{n_2(\lambda)-n_3(\lambda)\},$$

wherein a ratio of the depth of the second relief pattern to the depth of the first relief pattern $\alpha(=d_2/d_1)$ is set such that a phase shift function of the first relief pattern and a phase shift function of the second relief pattern are canceled out by each other.

37. A diffractive optical element comprising:

a first optical region made of a first optical material which reflects light within a wavelength range to be used;

a second optical region made of a second optical material which is substantially transparent to said light;

a third optical region made of a third optical material which is substantially transparent to said light but is different from said second optical material, said first, second and third

optical regions being arranged to be brought into contact with each other or being arranged close to each other;

a first relief pattern formed in a boundary surface between said first and second optical regions and having a first pitch distribution and a first depth; and

a second relief pattern formed in a boundary surface between said second and third optical regions and having a second pitch distribution which is substantially identical with said first pitch distribution of the first relief pattern and a second depth which is different from said first depth of the first relief pattern, said first and second relief patterns being substantially aligned in a direction of an optical axis of the diffractive optical element;, wherein said third optical region is constituted by an atmosphere surrounding the diffractive optical element.

38. A diffractive optical element comprising:

a first optical region made of a first optical material which is substantially transparent to light within a wavelength range to be used and has a refractive index n_1;

a second optical region made of a second optical material which is substantially transparent to said light but is different from said first optical material and has a refractive index n_2;

a third optical region made of a third optical material which is transparent to said light but is different from said second optical material and has a refractive index n_3, said first, second and third optical regions being arranged to be brought into contact with each other or being arranged close to each other;

a first relief pattern formed in a boundary surface between said first and second optical regions and having a first pitch distribution and a depth d_1; and

a second relief pattern formed in a boundary surface between said second and third optical regions and having a second pitch distribution which is substantially identical with said first pitch distribution of the first relief pattern and a second depth d_2, said first and second relief patterns being substantially aligned in a direction of an optical axis of the diffractive optical element, wherein when a ratio of the depth of the second relief pattern to the depth of the second relief pattern is $\alpha(=d_2/d_1)$, a wavelength of the light within the wavelength range to be used is λ, a shortest wavelength of the wavelength region to be used is λ_1, and a longest wavelength of the wavelength range to be used is λ_2, the following condition is satisfied:

$$|\Delta N(\lambda_2)| > |\Delta N(\lambda_1)| > 0; \quad \lambda_2 > \lambda_1$$

wherein

$\Delta N(\lambda) = \{n_1(\lambda)-n_2(\lambda)\} + \alpha \{n_2(\lambda)-n_3(\lambda)\}$,, wherein said third optical region is constituted by an atmosphere surrounding the diffractive optical element.

39. A diffractive optical element comprising:

a first optical region made of a first optical material which reflects light within a wavelength range to be used;

a second optical region made of a second optical material which is substantially transparent to said light;

a third optical region made of a third optical material which is substantially transparent to said light but is different from said second optical material, said first, second and third optical regions being arranged to be brought into contact with each other or being arranged close to each other;

a first relief pattern formed in a boundary surface between said first and second optical regions and having a first pitch distribution and a first depth; and

a second relief pattern formed in a boundary surface between said second and third optical regions and having a second pitch distribution which is substantially identical with said first pitch distribution of the first relief pattern and a second depth which is different from said first depth of the first relief

pattern, said first and second relief patterns being substantially aligned in a direction of an optical axis of the diffractive optical element;, wherein when an average refractive index of a composite relief structure constituted by the first and second relief patterns is n_0, a thickness of the diffractive optical element is D, and a smallest pitch of the relief patterns is T, the following condition is satisfied:

$$\frac{2\pi\lambda D}{n_0 T^2} < 1$$

40. A diffractive optical element comprising:

a first optical region made of a first optical material which is substantially transparent to light within a wavelength range to be used and has a refractive index n_1;

a second optical region made of a second optical material which is substantially transparent to said light but is different from said first optical material and has a refractive index n_2;

a third optical region made of a third optical material which is transparent to said light but is different from said second optical material and has a refractive index n_3, said

first, second and third optical regions being arranged to be brought into contact with each other or being arranged close to each other;

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a first relief pattern formed in a boundary surface between said first and second optical regions and having a first pitch distribution and a depth d_1; and

a second relief pattern formed in a boundary surface between said second and third optical regions and having a second pitch distribution which is substantially identical with said first pitch distribution of the first relief pattern and a second depth d_2, said first and second relief patterns being substantially aligned in a direction of an optical axis of the diffractive optical element, wherein when a ratio of the depth of the second relief pattern to the depth of the second relief pattern is $\alpha(=d_2/d_1)$, a wavelength of the light within the wavelength range to be used is λ, a shortest wavelength of the wavelength region to be used is λ_1, and a longest wavelength of the wavelength range to be used is λ_2, the following condition is satisfied:

$$| \Delta N(\lambda_2) | > | \Delta N(\lambda_1) | > 0, \ \lambda_2 > \lambda_1$$

wherein

$\Delta N(\lambda) = \{n_1(\lambda) - n_2(\lambda)\} + \alpha \{n_2(\lambda) - n_3(\lambda)\}$,, wherein when an average refractive index of a composite relief structure constituted by the first and second relief patterns is n_0, a thickness of the diffractive optical element is D, and a smallest pitch of the relief patterns is T, the following condition is satisfied:

$$\frac{2\pi\lambda D}{n_0 T^2} < 1$$

41. A diffractive optical element comprising:

a first optical region made of a first optical material which reflects light within a wavelength range to be used;

a second optical region made of a second optical material which is substantially transparent to said light;

a third optical region made of a third optical material which is substantially transparent to said light but is different from said second optical material, said first, second and third optical regions being arranged to be brought into contact with each other or being arranged close to each other;

a first relief pattern formed in a boundary surface between said first and second optical regions and having a first pitch distribution and a first depth, and

a second relief pattern formed in a boundary surface between said second and third optical regions and having a second pitch distribution which is substantially identical with said first pitch distribution of the first relief pattern and a second depth which is different from said first depth of the first relief pattern, said first and second relief patterns being substantially aligned in a direction of an optical axis of the diffractive optical element;, wherein when a shortest wavelength of the wavelength range to be used is λ_1, a longest wavelength of the wavelength range to be used is λ_2, and a middle wavelength between λ_1 and λ_2 is λ_0 $(=(\lambda_1 + \lambda_2)/2)$, the following condition is satisfied:

$$\lambda_2 - \lambda_1 > 0.05\lambda_0$$

42. A diffractive optical element comprising:

a first optical region made of a first optical material which is substantially transparent to light within a wavelength range to be used and has a refractive index n_1;

a second optical region made of a second optical material which is substantially transparent to said light but is different from said first optical material and has a refractive index n_2;

a third optical region made of a third optical material which is transparent to said light but is different from said second optical material and has a refractive index n_3, said first, second and third optical regions being arranged to be brought into contact with each other or being arranged close to each other;

a first relief pattern formed in a boundary surface between said first and second optical regions and having a first pitch distribution and a depth d_1; and

a second relief pattern formed in a boundary surface between said second and third optical regions and having a second pitch distribution which is substantially identical with said first pitch distribution of the first relief pattern and a second depth d_2, said first and second relief patterns being substantially aligned in a direction of an optical axis of the diffractive optical element, wherein when a ratio of the depth of the second relief pattern to the depth of the second relief pattern is $\alpha(=d_2/d_1)$, a wavelength of the light within the wavelength range to be used is λ, a shortest wavelength of the wavelength region to be used is λ_1, and a longest wavelength of the wavelength range to be used is λ_2, the following condition is satisfied:

$$|\Delta N(\lambda_2)| > |\Delta N(\lambda_1)| > 0;\ \lambda_2 > \lambda_1$$

wherein

$\Delta N(\lambda) = \{n_1(\lambda)-n_2(\lambda)\} + \alpha\{n_2(\lambda)-n_3(\lambda)\}$;, wherein when a shortest wavelength of the wavelength range to be used is λ_1, a longest wavelength of the wavelength range to be used is λ_2, and a middle wavelength between λ_1 and λ_2 is λ_0 $(=(\lambda_1 + \lambda_2)/2)$, the following condition is satisfied:

$$\lambda_2 - \lambda_1 > 0.05\lambda_0$$

43. An optical device comprising a diffractive optical element according to claim 8.

44. An optical device comprising a diffractive optical element according to claim 9.

45. An optical device comprising a diffractive optical element according to claim 11.

46. An optical device comprising a diffractive optical element according to claim 12.